

## Appendix D: ARMS Estimates and Other Sources of Agricultural Data

The 1995 Agricultural Resource Management Study (ARMS) provided most of the data for this report. The U.S. Department of Agriculture's (USDA) Economic Research Service (ERS) and National Agricultural Statistics Service (NASS) conduct this survey (previously called the Farm Costs and Returns Survey or FCRS) each year. The ARMS is the most comprehensive national annual data source available on farm financial and operating characteristics. A major advantage of the ARMS over other data sources is that details on expenses, income, assets, debt, and many other items can be disaggregated by farm production region, farm size, production specialty, and other characteristics. Such detail is essential for a thorough understanding of farming, because farms are diverse enterprises.

Both ERS and NASS use ARMS data extensively for income, cost, and expenditure estimates, for measuring farm financial performance and farm household well-being, and for a wide variety of staff analyses. ERS annually produces cost-of-production estimates for crops, livestock, and dairy, as well as farm business and farm household income and balance sheet estimates [8,9]. NASS annually releases ARMS statistics on farm production expenses [15] that are used for weighting in the construction of prices-paid indexes. ERS periodically publishes detailed summaries of financial and related characteristics of U.S. farms [10, 11], farm operators [4, 6, 10], and farm operator households [1]. ERS also provides information on the financial status of farms and farm operator households on the internet via the ERS World Wide Web Site (Farm Business Economics Briefing Room) [12], as well as in professional journals, conference presentations, and other outlets.

### Comparability With Other Sources of Agricultural Data

ARMS estimates, for various reasons, often differ from other agricultural data sources. Therefore, direct comparisons between ARMS estimates published in this report and other available data should be made only with careful consideration to sample design, data collection procedures, and underlying variable definitions.

**Previous ERS/NASS Surveys.** The procedures that NASS uses to expand the ARMS (formerly called FCRS) sample to create national estimates were rewritten in 1992 to more accurately account for coverage of farms and nonresponse. The data for calendar year 1991 were adjusted and resummarized using these new procedures [3]. Earlier estimates from the ARMS did not represent the entire farm population; the number of farms represented in the ARMS was usually between 1.7 million and 1.8 million. The new procedures, however, adjust the expanded number of farms to match the official estimates of approximately 2 million farms. Estimates since 1991, therefore, are not comparable with those for earlier years.

**Census of Agriculture.** Both the census of agriculture and the ARMS gather economic and physical agricultural data from the same target population, that is, all farms that sold or normally would have sold at least \$1,000 worth of agricultural products. Despite using the same definition to identify a farm, there are several differences that limit the comparability of information obtained from these data sources.

The most obvious differences pertain to sample design and data collection procedures. Participation in the census of agriculture is mandatory for all farm operators, while the ARMS relies on voluntary response from a selected sample of farm operators. As a result, the census has a nearly complete enumeration of farms (approximately 91 percent of farms and 96 percent of agricultural production for the last five censuses) [17]. In contrast, the ARMS uses a probability-based, multiframe sampling approach, which provides estimates that are representative of the U.S. population of farms based on the selected sample.

Census of agriculture questionnaires are mailed to all farms identified on the census mail list and are completed by respondents using detailed instructions for completing the report form. ARMS data are collected through personal interviews by trained enumerators. The ARMS is conducted in the 48 contiguous States, while the census includes

Alaska and Hawaii. The census of agriculture also includes institutional farms, which are excluded from the ARMS. And, the census of agriculture is conducted every 5 years, while the ARMS is conducted annually.

Sometimes there are also conceptual differences associated with specific pieces of information obtained from these surveys due to the wording of questions or the instructions associated with collecting the information. For example, the census obtains a combined estimate of expenses paid by all participants in the farm business, which includes stakeholders in the operation (operators, partners, and shareholders), landlords, and contractors. This estimate is subtracted from the estimated total value of products sold to obtain an estimate of the net cash returns to all participants in the business. The ARMS, however, obtains separate estimates of income and expense items for the farm operation. This allows computation of net cash income and other detailed financial information for the farming operation as a separate entity. Also, the level of detail may differ between the types of questions asked, which prohibits direct comparisons.

**Other USDA Agricultural Data Series.** Estimates of income, expenses, assets, and debt of the U.S. farm sector reported in the *Farm Business Economics Report* (FBER) [9] are not directly comparable with estimates from this report. The estimates in those publications represent a combination of several data sources. In many instances, procedures used and assumptions made are dictated by the format of available data. Since the ARMS estimates represent farm operations, these estimates are typically below those of the FBER, which represent the entire farm sector (farm operations, landlords, contractors, and others). In addition, FBER estimates cover all 50 States, compared with the 48 contiguous States covered by the ARMS.